**School of Planning and Architecture: Vijayawada**
(An Institution of National Importance under the Ministry of Education, Govt. of India)
Survey No.4/4, ITI Road, Vijayawada-520008, Andhra Pradesh, India

Department of Architecture

**Course:** **MBEM114 - Construction Technology, Materials and Methods** **Class:** I Yr MBEM I Sem A.Y. 2024-25
**Instructors:** Dr. P. Siva Prasad **Internal Assessment:** 50
**External Theory Exam:** 50
**Contact Periods/ week:** 03 periods (55 min each) **Total Marks:** 100
**Time Table:** **Credits:** 3
**Attendance:** Min 75% **Min. Passing Marks:** 50% each in Internal & External Assessment, 50% in Aggregate

**Objective: To study and understand the properties of modern construction materials used in construction such as special concretes, metals, composites, water proofing compounds, nonweathering materials, and smart materials. To study and understand the latest construction techniques applied to engineering construction for sub structure, super structure.**

**Out Line of the Course**:

**LECTURE PLAN**

| WEEK | DATE | TOPIC OF CLASS LECTURE & DISCUSSION | TOPIC OF STUDIO WORK& ASSIGNMENTS / REMARKS |
|---|---|---|---|
| 1 | Week-1 | Concretes, Behaviour of concretes – Properties and Advantages of High Strength and High Performance Concrete. | Lecture/Discussion/Studio |
| 2 | Week-2 | Properties and Applications of Fibre Reinforced Concrete, self compacting concrete. | Lecture/Discussion/Studio |
| 3 | Week-3 | Types of Steels – Manufacturing process of steel – Advantages of new alloy steels. | Lecture/Discussion/Studio |
| 4 | Week-4 | Properties and advantages of aluminium and its products – Types of Coatings & Coatings to reinforcement – Applications of Coatings. | Lecture/Discussion/Studio |
| 5 | Week-5 | Composites - Types of Plastics – Properties & Manufacturing process – Advantages of Reinforced polymers – Types of FRP – FRP on different structural elements – Applications of FRP. | Lecture/Discussion/Studio |
| 6 | Week-6 | Other Materials Types and properties of Water Proofing Compounds – Types of Non-weathering Materials and its uses – Types of Flooring and Facade Materials and its application. | Lecture/Discussion/Studio |
| 7 | Week-7 | **Mid-Semester examination** | **Mid-semester examination** |
| 8 | Week-8 | Smart and Intelligent materials - Types and features of smart and Intelligent Materials. | Lecture/Discussion |
| 9 | Week-9 | Case studies showing the applications of smart & Intelligent Materials. | Lecture/Discussion/Studio |
| 10 | Week-10 | Foundation for tall buildings- Pile foundation, Raft foundation- types and applications. | Lecture/Discussion/Studio |
| 11 | Week-11 | Piling techniques – Vacuum dewatering of concrete flooring – Concrete paving technology. | Lecture/Discussion/Studio |

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| 12 | Week-12 | Techniques of construction for continuous concreting operation in tall buildings of various shapes and varying sections. | Lecture/Discussion/Studio |
| 13 | Week-13 | Erection techniques of tall structures, Large span structures. | Lecture/Discussion/Studio |

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| 14 | Week-14 | Launching techniques for heavy decks – in-situ prestressing in high rise structures. | Lecture/Discussion/Studio |
| 15 | Week-15 | Post tensioning of slabaerial transporting – Handling and erecting lightweight components on tall structures. | Lecture/Discussion/Studio |

| S. No. | Stages of Evaluation | Weightage |
|---|---|---|
| 1 | First stage: Assessment –1 | 15 |
| 2 | Second stage: Mid-semester Examination | 20 |
| 3 | Third stage: Assessment –3 | 15 |
| | Total | 50 |

**Outcome: Student will have clear picture on the properties of modern construction materials used also will gain knowledge on the latest construction techniques used in engineering construction for sub and super structure of the buildings.**

Reference Books:


1. ACI Report 440.2R-02, “Guide for the design and construction of externally bonded RP systems for strengthening concrete structures”, American Concrete Institute, 2002.
2. Aitkens, "High Performance Concrete", McGraw Hill, 1999
3. Ashby, M.F. and Jones. D.R.H.H. “Engineering Materials 1: An introduction to Properties, applications and designs”, Elsevier Publications, 2005.
4. Deucher, K.N, Korfiatis, G.P and Ezeldin, A.S, "Materials for civil and Highway Engineers", Prentice Hall Inc., 1998.
5. Mamlouk, M.S. and Zaniewski, J.P., "Materials for Civil and Construction Engineers", Prentice Hall Inc., 1999.
6. Santhakumar. A.R., "Concrete Technology", Oxford University press, New
7. Shan Somayaji, "Civil Engineering Materials", Prentice Hall Inc., 2001
8. Shetty M. S, "Concrete Technology: Theory and Practice", S. Chand & Company Ltd., 2005.
9. Jerry Irvine, Advanced Construction Techniques, CA Rocketr, 1984
10. Robertwade Brown, "Practical foundation engineering hand book", McGraw Hill Publications, 1995.
11. Sankar, S.K. and Saraswati, S., "Construction Technology", Oxford University.


**Course Instructors:**
sd/-
(Dr. P. Siva Prasad)

**Head of Department :**
sd/-
(Dr. D. Srinivas )